

WHAT IS CLAIMED IS:

1. 1. A method of decreasing the allergenicity of an allergenic protein comprising:
 - (a) treating a protein containing disulfide bonds with an amount of thioredoxin, nicotinamide adenine dinucleotide phosphate-thioredoxin reductase and NADPH or an amount of dithiothreitol effective for and at a temperature effective for reducing at least one of the disulfide bonds in said protein;
 - (b) reacting the protein from step (a) with an amount of a physiological disulfide effective for preventing reoxidation of at least one of the reduced disulfide bonds in said protein from step (a); and
 - (c) administering the reacted protein in step (b) to an animal, wherein said allergenic symptoms exhibited by said animal administered the protein from step (b) are decreased as compared to a control.
2. The method of claim 1 wherein the allergenic protein is selected from the group consisting of cow's milk, egg, soy, rice, wheat, barley, peanut and pollen proteins.
3. The method of claim 1 wherein the physiological disulfide is cystamine or oxidized glutathione.
4. The method of claim 3 wherein the amount of cystamine is about 0.4 μ moles to about 40 μ moles per mg of protein.
5. The method of claim 3 wherein the amount of oxidized glutathione is about 0.4 μ moles to about 40 μ moles per mg of protein.
6. A method of decreasing the allergenicity of an allergenic food comprising:
 - (a) contacting an allergenic food having at least one allergenic protein containing disulfide bonds with an amount of thioredoxin,

nicotinamide adenine dinucleotide phosphate-thioredoxin reductase and NADPH or effective for reducing at least one of said disulfide bonds in said protein;

(b) treating the food from step (a) with an amount of a physiological disulfide effective for preventing reoxidation of at least one of the reduced disulfide bonds in said protein in said food in step (a); and

(c) administering the treated food in step (b) to an animal allergic to said food, thereby decreasing the allergenic symptoms exhibited by said animal as compared to a control.

7. The method of claim 6 wherein said food contains milk or peanut.

8. The method of claim 6 wherein the physiological disulfide is cystamine or oxidized glutathione

9. The method of claim 8 wherein the amount of cystamine is about 0.4 μ moles to about 40 μ moles per mg of protein in said food.

10. The method of claim 8 wherein the amount of oxidized glutathione is about 0.4 μ moles to about 40 μ moles per mg of protein in said food.

11. A method of decreasing the allergenicity of an allergenic protein comprising:

(a) heating a protein containing disulfide bonds at a temperature from about 40°C to about 70°C with an amount of dithiothreitol effective for reducing said protein; and

(b) administering the heated protein in step (a) to an animal, wherein said allergenic symptoms exhibited by said animal administered the protein from step (b) are decreased as compared to a control.

12. The method of claim 11 wherein the allergenic protein is selected from the group consisting of cow's milk, egg, soy, rice, wheat, barley, peanut and pollen proteins.

13. A method of decreasing the allergenicity of an allergenic protein comprising:

(a) reducing a protein containing disulfide bonds with an amount of dithiothreitol effective for and at a temperature effective for reducing said protein;

(b) allowing the protein from step (a) to reoxidize; and

(c) administering the treated protein in step (b) to an animal, wherein said allergenic symptoms exhibited by said animal administered the protein from step (b) are decreased as compared to a control.

14. A method of increasing the digestibility by pepsin of a protein comprising:

(a) reducing a protein containing disulfide bonds with an amount of thioredoxin, nicotinamide adenine dinucleotide phosphate-thioredoxin reductase and NADPH or an amount of dithiothreitol effective for and at a temperature effective for increasing the digestibility of said protein;

(b) reacting the protein from step (a) with an amount of a physiological disulfide effective for preventing reoxidation of at least one of the reduced disulfide bonds in said protein from step (a); and

(c) contacting the reacted protein in step (b) with pepsin, wherein the digestibility of the reacted protein is increased as compared to a control.

15. The method of claim 14 wherein the protein is selected from the group consisting of beef, cow's milk, egg, soy, rice, wheat, barley, peanut and pollen proteins.

16. The method of claim 14 wherein the physiological disulfide is cystamine or oxidized glutathione.

17. A method of increasing the digestibility by pepsin of a food comprising:

(a) contacting a food having at least one protein containing disulfide bonds with an amount of thioredoxin, nicotinamide adenine

dinucleotide phosphate-thioredoxin and NADPH effective for reducing at least one of said disulfide bonds in said protein;

(b) treating the food from step (a) with an amount of a physiological disulfide effective for preventing reoxidation of at least one of the reduced disulfide bonds in said protein in said food in step (a); and

(c) administering the treated food in step (b) to an animal, thereby increasing the digestibility of the food as measured by the symptoms exhibited by said animal as compared to a control.

18. The method of claim 17 wherein said food contains cow's milk, egg, soy, rice, wheat, barley or peanut.

19. The method of claim 17 wherein the physiological disulfide is cystamine or oxidized glutathione.

20. A method of decreasing the allergenicity of an allergenic protein comprising:

(a) reducing a protein containing disulfide bonds with an amount of thioredoxin, nicotinamide adenine dinucleotide phosphate-thioredoxin reductase and NADPH or an amount of dithiothreitol or an amount of lipoic acid for reducing said protein;

(b) reacting the protein from step (a) with an amount of a physiological disulfide effective for stabilizing said protein from step (a); and

(c) administering the reacted protein in step (b) to an animal, wherein said allergenic symptoms exhibited by said animal administered the protein from step (b) are decreased as compared to a control.

21. The method of claim 20 wherein the allergenic protein is selected from the group consisting of cow's milk, egg, soy, rice, wheat, barley, peanut and pollen proteins.

22. The method of claim 20 wherein the physiological disulfide is cystamine or oxidized glutathione.



23. A method of decreasing the allergenicity of an allergenic protein comprising:

- (a) treating a protein containing disulfide bonds with an amount of thioredoxin, nicotinamide adenine dinucleotide phosphate-thioredoxin reductase and NADPH effective for reducing said protein;
- (b) allowing the protein from step (a) to reoxidize; and
- (c) administering the treated protein in step (b) to an animal, wherein said allergenic symptoms exhibited by said animal administered the protein from step (b) are decreased as compared to a control.

24. A method of increasing the digestibility by pepsin of a food comprising:

- (a) contacting a food having at least one protein containing disulfide bonds with an amount of lipoic acid effective for increasing the digestibility of the food;
- (b) treating the food from step (a) with an amount of a physiological disulfide effective for maintaining the digestibility of said food in step (a); and
- (c) administering the treated food in step (b) to an animal, thereby increasing the digestibility of the food as measured by the symptoms exhibited by said animal as compared to a control.

25. The method of claim 24 wherein said food contains cow's milk, egg, soy, rice, wheat, barley or peanut.

26. The method of claim 24 wherein the physiological disulfide is cystamine or oxidized glutathione